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AUTHOR Neumann, Karl F.; And Others
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ABSTRACT

The adequacy of Rosenberg's classification scheme, in which he divides children's learning characteristics into four styles, was investigated. Middle school students (N=377) were used as a sample, and their behavior was assessed by 30 teachers using the Learning Style Checklist. After intercorrelations of the 40 Checklist items were obtained, the resulting matrix was factor analyzed, and four factors emerged which corresponded to Rosenberg's four learning styles: Rigid-Inhibited, Undisciplined, Acceptance-Anxious, and Creative. Results indicated that teachers' perceptions of their students appear to group themselves in the manner suggested by Rosenberg's system. (Author/HLM)

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Factor Analysis of Student Learning Styles[1]

Karl F. Neumann, John W. Barton, and

Joseph W. Critelli

North Texas State University

Denton, Texas 76203

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Running head: Learning Styles

Factor Analysis of Student Learning Styles

Cronbach and Snow (1977) suggest that students' characteristics, both aptitude and personality, may interact with teaching technique to affect learning. The identification of these student characteristics should be of particular importance for school psychologists as these types of student classification variables have direct implications for teacher behavior. However, from reviewing the literature in this area, Cronbach and Snow conclude that no such student by teacher interactions are "so well confirmed that they can be used directly as guides to instruction" (p. 492). The present study tests a descriptive theory of student "learning styles" (Rosenberg, 1968) which have been specifically designed to interact with teacher behavior.

Rosenberg identifies four independent learning styles. Each learning style is based on two dimensions of information-processing ability: (1) the person's openness to receiving information from within himself (intrapersonal) or from outside himself (extrapersonal), and (2) the person's "level of symbolization." Level of symbolization has two aspects: the first concerning how fully the student uses the information available to him and the second centering on whether the student integrates his world primarily in a concrete or an abstract manner. On the basis of these intrapersonal/extrapersonal and level-of-symbolization dimensions, Rosenberg

describes four learning styles: (a) "Rigid-Inhibited," (b) "Undisciplined," (c) "Acceptance-Anxious," and (d) "Creative."

The Rigid-Inhibited Learner. Students with this style are relatively closed to both extrapersonal and intrapersonal sources of information and tend to integrate this limited information in a concrete manner. Thus, this student has difficulty in handling the abstract, and may become confused unless directions are in simple concrete language. The behavior of the Rigid-Inhibited learner is characterized by dogmatic adherence to absolutist principles and structure. This child cannot tolerate uncertainty; in his search for structure he will look to others for assistance. His behavior is likely to be stereotyped and show little, if any creativity.

The Undisciplined Learner. The Undisciplined learner is more receptive to intrapersonal than extrapersonal sources of information and tends to process information in an abstract manner. The Undisciplined learner's activities are controlled primarily by immediate results; if a task does not provide him with immediate gratification, he will change to one that does. Both his inability to delay gratification and low tolerance for frustration make it difficult to keep this learner's attention on-task. He is energetic, but his energies are not goal directed. Behavior is often characterized as impulsive and he may be disruptive in the classroom.

The Acceptance-Anxious Learner. The Acceptance-Anxious learner is described as being more receptive to extrapersonal sources of information and although able to integrate this information in an abstract way, anxiety may prevent him from using this information fully. This type of student is so concerned with others' evaluation of his performance, that he often cannot effectively deal with the problem at hand. He tries to get others to confirm his worth either by getting them to like or admire him. This learner is clearly concerned about performance, but seems to be motivated by a need for recognition and approval (from adults) rather than by the rewards inherent in mastering the task for its own sake. He equates failure with rejection--errors and criticism are not seen as opportunities for improvement, but as a rejection of his individual worth. He desires to impress others and attempts to do a "superadequate" job. To do this, however, he tries to perfectionistically structure the task, and often gets lost in irrelevant details. This leads to a lowered self-esteem and the cycle continues.

The Creative Learner. Rosenberg describes these individuals as being maximally receptive to both intrapersonal and extrapersonal sources of information, and as being able to integrate this information in a highly abstract way. The Creative learner is typically a self-confident child who participates actively in the classroom, though not necessarily

in the manner prescribed by the teacher. He is an independent learner and shows originality in attacking problems. He may make errors from time to time because of his unorthodox methods, but he learns quickly from mistakes and suffers little anxiety. Teachers are valued as useful sources of information and guidance, but they are not "overvalued."

It is Rosenberg's belief that these learning styles interact with teacher behavior in the classroom. Therefore, he feels that once the student's particular learning style is identified, the teacher can tailor teaching methods to fit the student's behavior. Rosenberg discusses various teaching strategies he feels are particularly useful for each learning style. For example, with the Rigid-Inhibited learner, the teacher should attempt to present information in a concrete manner (perhaps using pictures and models), reduce the number of alternatives with which the student must deal, and provide structure at the first sign of confusion. Rosenberg feels the Undisciplined learner may benefit if the teacher consistently gives immediate feedback concerning the social consequences of his behavior (such as staying after school to finish incomplete assignments). Social isolation or "time out" following disturbances may also be helpful with this child. Conversely, with the Acceptance-Anxious learner, the teacher should refrain from emphasizing consequences and allow the student to assess his own progress (perhaps by

substituting record charts or graphs for grades given by the teacher). Rosenberg feels that these students may be helped by eliminating teacher value judgments of work and gradually increasing work performed independently. Independent work is also suggested for the Creative learner. In addition, Rosenberg feels that Creative learners should be given the opportunity to think divergently and to use intuition instead of memorization.

While Rosenberg's styles are based on his own theoretical conceptions of the information-processing abilities of children, he points out that other researchers have found styles similar to those he describes. This research includes studies from such divergent populations as nursery school children (Richards & Simon, 1941), kindergartners (de Hirsch, Jansky, & Langford, 1966), college students (Heath, 1964), and industrial managers (Blake & Mouton, 1964; Zaleznik & Moment, 1964). However, the four learning styles as described in his system, have never been empirically investigated.

The present study tests the adequacy of Rosenberg's classification scheme, i.e., do children's learning characteristics group themselves into the four hypothesized "styles?" To test this classification scheme, a "Learning Style Checklist" was constructed from the behavioral characteristics Rosenberg attributes to the four student types. The present study involves a factor analysis of these checklist items using a large sample of predominantly Black middle school students.

Method

Subjects

The subject pool consisted of the entire eighth-grade class of a middle school in a large city in North Central Texas. The 327 students in the sample were approximately equally divided with respect to sex (179 males, 198 females). The sample included 288 Blacks, 60 Whites, 12 Mexican Americans, and two students classified as "other." Fifteen students were not classified by their teachers according to race and procedures guaranteeing student anonymity prohibited the collection of this information at a later time.

Instrument

The Learning Style Checklist is an instrument constructed from Rosenberg's behavioral characteristics for the four learning styles. Rosenberg has listed ten such characteristics of students in each category. Thus, the final checklist contains 40 items which have been randomly positioned in the list. A copy of this checklist is shown in Table 1.

Insert Table 1 about here

Procedures

Thirty teachers were selected from the students' schedule cards to complete the checklists. The rater (teacher) was asked to check only those items in the checklist that applied to the student being rated. Checklists were assigned to

teachers so that only one rating was obtained for each student, and so that no teacher was required to rate more than 20 students. Teachers from a wide variety of school subjects were used. Students were rated late in the spring semester of the school year. Thus, teachers had at least three months of contact with the students they rated.

Intercorrelations of the 40 items were obtained and the resulting matrix was factor analyzed (unities in diagonals). Four factors were extracted in accordance with Rosenberg's descriptive theory of four learning style dimensions. These factors, accounting for 43% of the total item variance, were then subjected to a varimax rotation.

Results

The factors are presented in Table 2. Items representing each factor were chosen if they (1) loaded at least .35 on that factor, and (2) loaded higher on that factor than on any other.

Insert Table 2 about here

Factor 1 corresponds with the Undisciplined learning style. All ten of the items Rosenberg attributes to the Undisciplined learner met the criteria for inclusion on this factor. Items loading highest on this factor were: "speaks disrespectfully to teacher," "makes derogatory remarks about the subject being taught," and "asserts independence in a

negative manner." Although representing smaller loadings on this factor than the ten "characteristic" items, two Acceptance-Anxious items were also found: "showing off" and "oversensitivity to criticism."

Factor 2 appears to represent Rosenberg's Creative style. Again, all ten of the items Rosenberg cites as descriptive of this style were included on this factor. The factor is defined by "thinking creatively in a new situation," "flexibility," and "openness to new ideas." "Friendliness toward teacher," thought by Rosenberg to be an Acceptance-Anxious descriptor, is also included on this factor. "Unresponsiveness," a Rigid-Inhibited item, loaded negatively on this factor.

Factor 3 may be interpreted as the Acceptance-Anxious learning style. The five items which obtained sufficiently high loadings to be included in this factor are all found in Rosenberg's description of the Acceptance-Anxious child. The highest loadings on this factor indicate the predominant characteristics of this learner are "worrying," "fearing failure," and "trying too hard."

Factor 4 reflects the characteristics of Rosenberg's Rigid-Inhibited learner. The seven items representing this factor are all used by Rosenberg to describe this learner. The highest loadings on this factor describe a child who is "confused easily," "unable to do the job without others," and noted for "answering inappropriately."

Discussion

The present study tested the adequacy of Rosenberg's theoretical conceptualization of four learning styles. The data indicate that the 40-item checklist can be summarized by four independent factors which correspond to the four learning styles hypothesized by Rosenberg. Based on these results, his conceptualization appears to be promising. The correspondence of the factors which emerged with the hypothesized styles is strikingly consistent across all four factors. Only a few of the items (specifically, items 19, 24, 28, and 36) failed to load highly enough to be included in any of the four factors, and even fewer (items 3, 11, and 38) appear to be misplaced in his conceptualization.

Thus, teachers' perceptions of their students do appear to group themselves in the manner suggested by Rosenberg's system. Future research should replicate this study with samples having a different racial composition to determine the suitability of this system for other student populations. However, since Rosenberg's system was not specifically formulated for use with Black students, the correspondence between the emerging factors and his four styles seems encouraging.

Again, it should be noted that Rosenberg's classification system was conceived as interacting with teaching technique. Future research will have to determine whether or not these learning styles do, in fact, behave in this way. The general

absence of useful student classification variables in past research suggests the need to test out promising systems such as this one.

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Footnote

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Table 1

Learning Style Checklist

1. Fearful of failure (AA)
2. Tells stories or describes things in an interesting fashion (C)
3. Wants to show off or impress others (AA)
4. Tends toward temper tantrums and wild destruction (U)
5. Becomes confused and disoriented easily (RI)
6. Misinterprets simple statements (RI)
7. Breaks classroom rules, destructive (U)
8. Gives answers which have nothing to do with the qeustion being asked (RI)
9. Can constructively assert himself (C)
10. Is open to new ideas (C)
11. Overly sensitive to criticism or correction (AA)
12. Tries TOO hard (AA)
13. Negativistic: "I won't" (U)
14. Shows initiative in bringing things which relate to classwork (C)
15. Likely to know the material when called upon to recite in class (C)
16. Makes derogatory remarks about the subject being taught (U)
17. Oblivious to what is going on in the classroom (RI)
18. Excessively competitive and jealous (AA)
19. Frequently seeks teacher contact and approval (AA)
20. Shows persistence in attacking problems (C)

Table 1--continued

21. Is flexible (C)
22. Asserts independence in a negative manner (U)
23. Tries to outdo classmates by producing more quantity (AA)
24. Afraid to assert self or show initiative (RI)
25. Thinks creatively in new situations (C)
26. Cannot get a job done unless others are immediately available to help him (RI)
27. Antisocial tendencies (steals, lies, destroys property, bullies, defies, resents discipline) (U)
28. Rigidly adheres to rules (RI)
29. Worries about pleasing others (AA)
30. Shows respect for teacher but can stand on own two feet (C)
31. Acts defiant, will not do what is asked (U)
32. Able to apply what he has learned to a new situation (C)
33. Speaks disrespectfully to teacher (U)
34. Prone to blame teacher or external circumstances when things don't go well (U)
35. Shows signs of nervousness (nail biting, crying, tics, rocking) (RI)
36. Outwardly nervous during test (AA)
37. Lacks tolerance for task he does not enjoy (U)
38. Friendly rather than distant in relationship with teacher (AA)
39. Upset by change in routine (RI)
40. Generally unresponsive, hard to get to know (RI)

Key: RI - Rigid-Inhibited U - Undisciplined
AA - Acceptance-Anxious C - Creative

Table 2

Factor Structure of the

Learning Style Checklist

Checklist Item Number		Factor Loading
	Factor 1: Undisciplined	
33.	Speaks disrespectfully to teacher	.76
16.	Derogatory remarks about subject	.72
22.	Asserts independence in negative manner	.71
31.	Acts defiant	.71
13.	Negativistic	.69
4.	Temper tantrums	.68
27.	Antisocial tendencies	.67
34.	Blames teacher/external circumstances	.66
37.	Lacks tolerance	.65
7.	Breaks rules	.63
3.	Shows off	.63
11.	Oversensitive to criticism/correction	.46
	Factor 2: Creative	
25.	Creative in new situations	.77
21.	Flexible	.76
10.	Open to new ideas	.74
9.	Asserts constructively	.71
32.	Applies learning to new situations	.66
14.	Initiative	.66
30.	Respectful, but independent	.66

Table 2--continued

15.	Prepared	.65
38.	Friendly toward teacher	.54
40.	Unresponsive	-.50
2.	Interesting storyteller	.50
20.	Persistent	.43
	Factor 3: Acceptance-Anxious	
29.	Worries	.68
1.	Fears failure	.60
12.	Tries too hard	.55
18.	Competitive and jealous	.50
23.	Tries to outdo classmates through quantity	.49
	Factor 4: Rigid-Inhibited	
5.	Confused easily	.76
26.	Can't do job without others	.52
8.	Inappropriate answers	.51
6.	Misinterprets simple statements	.49
35.	Nervousness	.47
39.	Upset by change	.43
17.	Oblivious to what is going on	.41